

The physical classroom learning environment

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Abstract: *Learning environment is a major aspect in the teaching and learning process and is crucial to determine students' learning. Learning environment stimulates students' engagement in the learning process and influences their behaviour. Besides that, it also assists in the development of students' skills and cognitive abilities. In Malaysia, study on classroom's learning environment, in particular the physical aspect and its features are still at the preliminary stage. Thus, the purpose of this paper is to discuss classroom learning environments focusing on the physical aspects and its features. It will also discuss theories and models related to learning environments. In addition, the characteristics aspects for future physical classroom learning environments are suggested.*

Keywords: *Learning environment, physical aspect, learning*

Introduction

The learning environment refers to the space allocated for either classrooms, science labs, open spaces and offices. Learning environment is also defined as the social context, psychological and pedagogical which can affecting learning, achievement and attitudes of the students. Learning environment and features that are in it played a major role in improving learning in schools and is identified as major determinants of student learning. Learning environment capable of stimulating students to engage in the learning process and be able to

influence the behavior of students as well as to assist in the development of their skills or cognitive perception.

Two major components of the learning environment are physical component and psychosocial component (Fraser, 1994; Kilgour, 2006). Physical component includes all physical aspects such as classrooms, teaching materials and learning facilities, both inside and outside the classroom. While psychosocial component is related to the interaction that occurs between students and students, students with teachers and students with the environment. Both of these components complement each other in creating and shaping the learning environment and affect the learning process that occur in it.

The theory of learning environment

Various theories and models have highlighted the importance of learning environment in the learning and teaching process. Among them are Lewin field model, Walberg productivity model, model of conceptual systematic change and model representation schematics productivity education.

Lewin field model

The study of learning environments began 60 years ago by Lewin and Muray. In his study, Lewin (in Fraser 1998) have studied the problems associated with the individual's motivation and motivation within the group in a particular situation. Based on his research, Lewin recommended a formula that explained about human behavior that is $B = f(P, E)$. In this formula, B described as human behavior which are formed as a result of an individual's personality functions (P) and environment (E). According to Lewin, for a variety of business done is public life of an individual. This life space contain the individual and psychological environment that exist for them. This formula has identified that the environment and interaction with personality is an important factor in determining human behavior.

Walberg productivity model

The importance of the learning environment has been highlighted by Walberg (1981). In his model, Walberg has identified nine elements that affect the productivity of education and those nine elements work together to improve student achievement (Figure 1.0).

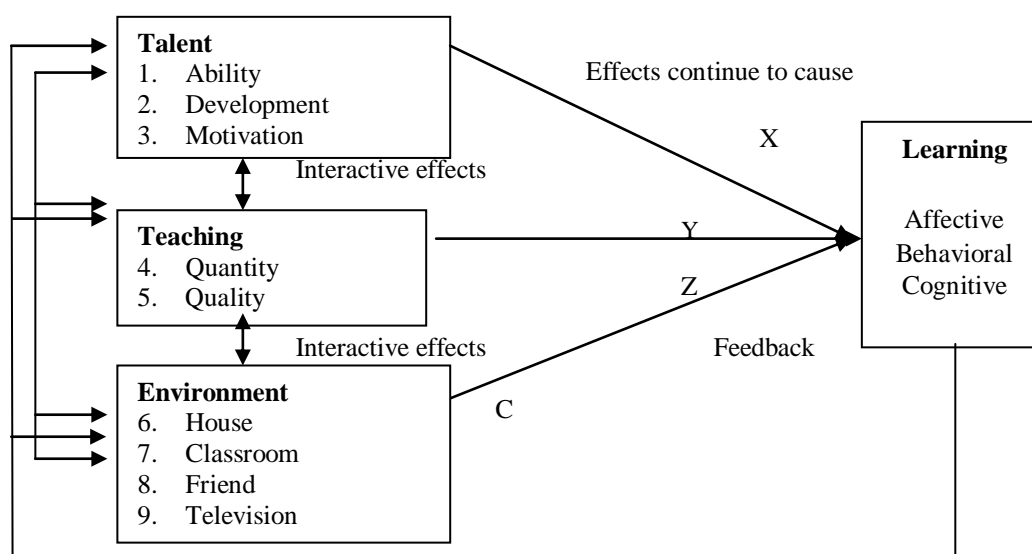


Figure 1.0 Walberg educational productivity model

According to Walberg, nine of the elements contained in the three important factors that influence the production of learning were talent, teaching methods and environments. These factors are very important and mutually interact and directly impact on the production of learning in terms of affective, cognitive and behavioral students. Instead of learning outcomes in terms of affective, behavioral and cognitive development may also provide information or related to talent assessment, teaching and learning environment for students. Thus, according to Walberg, to enable effective learning occurs, nine elements must be properly understood by a teacher.

These elements are the ability, the level of development, motivation, quantity of instruction, quality of teaching, the home environment, classroom environment, peer groups and the mass media, especially television. The nine aspects will interact with each other and need to be understood and manipulated by a teacher as much as possible. This is because all these elements are very important and mutually affect substantially in terms of determining the production of effective learning, cognitive and behavioral students.

Model of conceptual systematic change

Gardiner (1989) also suggest a model that displays the relationship between the factors that influence students in technology learning environment. In the model (see Figure 2.0), Gardiner shows three overlapping circles in which every one of them described as ecosfera, sociosfera and tecnosfera. Ecosfera associated with the physical environment and the students around him. Sociosfera was associated with the outcome of individual interactions with others in their environment, while tecnosfera described as a man-made learning environment. According to Gardiner, individuals or students in the middle and is the most complex component in the system. This shows that a student is influenced by all aspects in the environment, including the physical and psychosocial aspects.

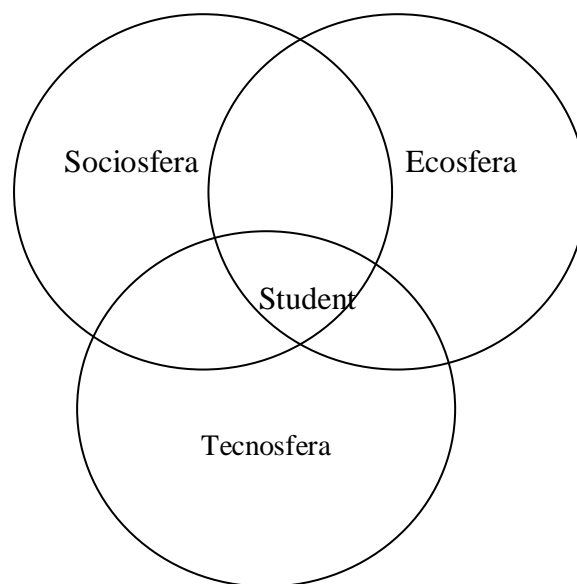


Figure 2.0 model of conceptual systematic change

Based on the model presented by Gardiner (1989), Zandvliet (1999) has put forward a model in its review of the physical and psychosocial environment in the classroom with technology. According Zandvliet (1999) in educational situations, Gardiner Models can be modified with the classroom physical environment as ecosfera, classroom psychosocial environment as sociosfera and implementation of new educational technologies represent tecnosfera component in this model. All these factors are considered to be related to student satisfaction (Figure 3.0).

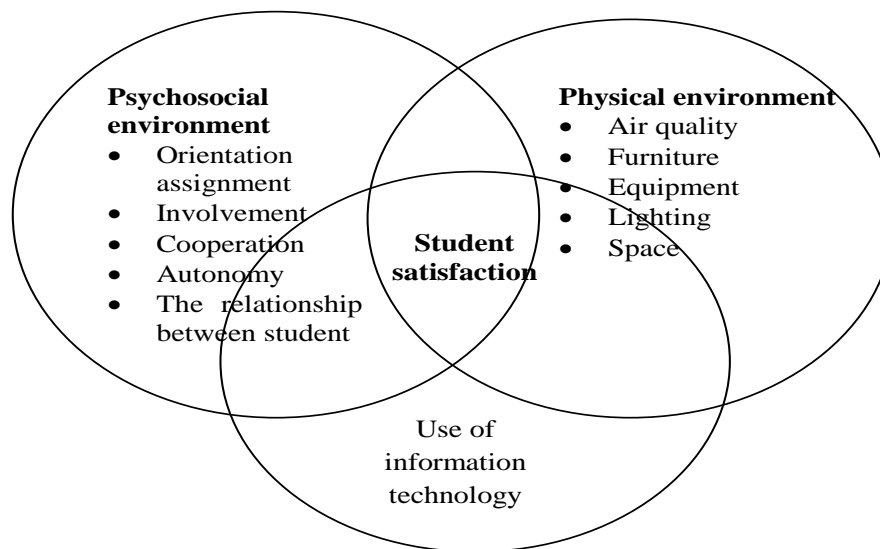


Figure 3.0 conceptual model of potential factors influencing student satisfaction

Model representation schematics productivity education

Zandvliet (1999) has put forward a model as a result of a study conducted on high-tech learning environment. This model shows the correlation between the physical environment and the psychosocial environment and suggests that physical factors in the classroom environment may contribute to student satisfaction (through relationships with psychosocial variables). This model also suggested that by manipulating the physical factors (such as lighting and workplaces) that influence the overall classroom environment, we may be able to generally increase productivity in education (see Figure 4.0).

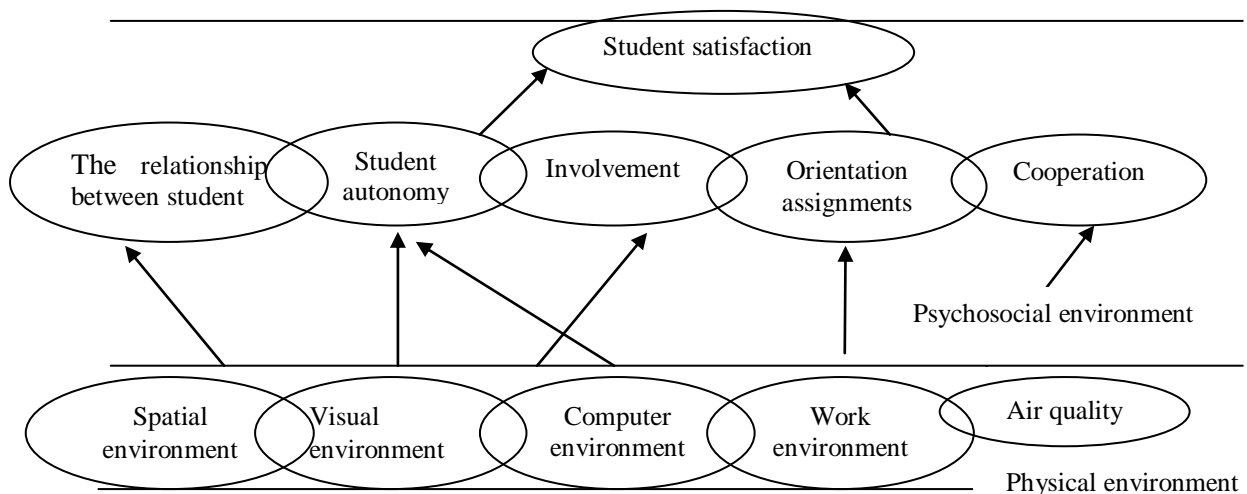


Figure 4.0 Model representation schematics productivity education

In total, there are various models that highlighted in characterize the effects in the learning environment, whether in the context of education environment or in the classroom. In the context of the classroom, learning environment plays an important role and have an impact on the teaching and learning process and can affect students from either cognitive or affective aspects. Elements that are in the classroom seems to interact with each other and have an impact on learning outcomes that occurred and may also influence the behavior of students. Therefore, increase the quality of the learning environment seems to be able to increase the efficiency of teaching and learning process and learning environment is an important dimension that should be considered and given attention because of its ability to affect people.

Physical learning environment

Most of the student's time in a year spent in the classroom learning environment. Therefore, the classroom physical learning environment can have a major influence to the student. Previous studies conducted found the physical aspects of the learning environment can affect psychological and social behavior (Barker, 1968; Moos, 1979) and have a significant impact on learning (Chism, 2006; Monahan, 2002; Strange & Banning, 2001). In this regard, we need to conduct more study on existing physical environment and its impact on learning (Chism, 2006).

Weinstein and Mignano (2003) stated there are six basic functions of the physical environment; for security and protection, as the social context, as a symbolic identifier, as a tool to do the task, having the function of fun and function as a place for student growth.

Loughlin and Suina (1982) also considers the physical learning environment as an important teaching tool for teachers. Teachers need to plan the layout and learning space in order to meet the learning goals and provide a comfortable learning environment for students. Accordingly, there are many bad behavior resulting from weaknesses in existing learning environment.

Meanwhile, Tessmer and Harris (1992) stated there are three kinds of physical factors of learning environment to develop effective teaching. First, learning facilities including state of the furniture and learning location take place. The location may be a classroom, a computer lab, a science lab, an office or any place where learning occurs. Important aspect of facilities are in the learning space, a seating area, temperature, sound, lighting and accessibility.

Second, instructional materials related to objects used in the environment by teacher and students. Teaching materials are as attachments, video tapes, computer compact discs and books. Factors that should be seen when designing teaching is related to teaching materials whether can be customized, easy to use, can be reproduced and can be replaced. Third, the equipment and materials for teaching and learning that are frequently used.

An attractive learning environment, the way furniture is arranged, the lighting used, the ability of wall to absorb sound and floor properties have been identified to affect student achievement (Tanner, 2000). In addition, the physical environment can also affect learning, ideas, values, attitudes and culture and if properly planned, positive learning environment will affect the learning process (Sanoff, 2000). According Matai and Matai (2007), the design of the physical environment has a significant effect on the behavior and in turn, can form a particular social organization.

Proposed Design for Future Learning Environments

Learning happens in the future is likely to differ from the present study. With the advancement and development of technology, information available without limitation. Thus, a wise consideration should be taken in designing learning environment to support changes, so the learning environment will be adapted to the needs of both present and future. Besides, the learning environment in the future need to consider aspects that could have an impact on the teaching and learning process.

In the learning environment, particularly in schools, furniture, equipment and learning facilities are basic elements that are available. The type of furniture used, pattern arrangement and facilities should reflect the emphasis on learning pedagogy to be implemented. To enable proper learning process, basic elements provided should be appropriate, adequate and functioning properly. Lack of completeness of educational equipment will lower motivation and creativity of teachers and students as well as limiting learning and teaching activities. Thus, the element of flexibility may be included as a criteria in the selection and design of furniture and educational equipment. For example, in a learning environment, flexibility element can be adapted in the use of tables and chairs that can be moved (has wheels) and the middle wall that can be shifted when needed. The use of portable tables and chairs will allow teachers and students to organize the furniture according to their needs and learning activities that will be implemented. Element of flexibility in the classroom will be able to promote cooperation, interaction and collaboration between students.

One thing related to flexibility is easy to use. Furniture and equipment should be sturdy flexible, easy to use and easily modifiable. Modification must be done in a short time and can be made directly by the student or teacher. It is important to ensure its use for a prolonged period and does not cause any problems.

Additional, learning environment in the future should also take into account the principles of ergonomics in the design of furniture and equipment used. This is important in ensuring the comfort of the teachers and students who spend most of their time in the classroom. Ergonomic principles ensure that furniture and equipment as well as a learning environment adapted to teacher and student body. Height of tables and chairs, seat width, fabric used and the position back on the chair is one of the elements that need to be considered as limitations may interfere with the concentration of students. Consider ergonomic features in the design furniture and equipment will be able to maximize the comfort, safety, productivity and efficiency of students. The use of ergonomic principles in this learning environment can also increase the effectiveness of teaching and learning as well as to improve health and student safety.

Space is also an important aspect of the learning environment. Floor area should be adapted to the number of students and activities to be accomplished. One element that should be incorporated in the learning space is a multifunctional element. Multifunctional learning space means the space can be used for various functions either to the learning of science subjects, biology, chemistry or physics or for other disciplines. This learning space can be adapted to individual learning, group, computer, discussion and collaboration activities, traditional learning, discussion involving the entire class, conduct experiments and demonstrations. This can encourage the use of various strategies for teaching and interactive learning with an easier transition and thus integrate theory and practice more effectively. In

addition, other elements that must be included in the new learning environment space including comfort, stimulation of the senses, has the support of technology, student-centered, has a collaborative network of learning resources such as library, student learning combining with shelter and study area and meeting place for academic discussion.

Technology integration is also important because of its development has changed the way teachers teach and the way students learn. Based on the behavior of students at present, it is necessary for us to meet current needs and learning space that combines space, technology and services. The technology integration in the learning environment give means that the environment must be planned, designed and constructed to suit the technology that would like to use. Students in the future may not need to write on paper anymore otherwise use the latest technology such as laptops. Thus, the learning environment must be equipped with appropriate furniture and has a lot of power sources to meet the needs of students. In addition, the learning environment should also provide a safe storage place for technology equipments while ensuring an efficient internet access. Integrated learning with technology such as laptops or PC equipped with wireless internet network is allowing students to find additional information on the web and engage in collaboration.

Changes in design and the role of the learning environment should be in line with the lighting. Lighting aspect is important because it involves the ability of students to see clearly what teachers explain or any activities carried out by the teacher and a friend. At the present time, the determination of the lighting in the classroom learning environment is increasingly difficult due to the increased use of technological devices such as computers, cable TV and digital projectors. This is because technology equipment requires a different light and brightness to optimize utility. Thus, all elements of technology in the learning environment should be considered in selecting the type of lighting besides the brightness of the light used in the learning environment.

New environment should also have a good indoor air quality. To ensure that the learning environment and learning process can occur well, indoor air quality should be optimized in accordance with the needs of teachers and students. Indoor air quality in a learning environment contributed by three factors, namely, temperature, humidity and air flow. Temperature of cold and heat in the learning environment affect student's focus during learning. Temperature should be appropriate to the age and learning activities performed. Therefore, the new environment should be equipped with temperature control devices to enable the room temperature is controlled according to the learning needs. Air humidity in a new environment also needs to be ensured in good condition because of normal and high humidity can contribute to health problems among students. Furthermore, the new learning environment should be planned and designed properly so that its position is not close to water resources or water flow in the building to ensure there are no formation of water retention which may contribute to the high humidity in the learning environment. Besides, air flow in and out of the learning environment should occur effectively. Thus, the new learning environment should be designed to ensure good air inflow and outflow can occur effectively. Other than that, the new environment should be built with a sufficient number of windows in addition to having wide openings to allow maximum air exchange. The number of fan should be enough and in accordance with the size of the classroom to help the air flow in and out.

By improving the physical aspects, new learning environments are expected to encourage more collaboration among students and teachers, allow proliferation of ideas and ability of the students in problem solving. In conclusion, the learning environment is an

important aspect that can be manipulated to encourage active participation in the learning process . Physical aspects of the learning environment should be optimized to enhance the effectiveness of teaching and learning process. By ensuring the physical learning environment in good condition and meet the needs of teachers and students, the effectiveness and the success of the teaching and learning process could be improved.

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